ABSTRACT

A device for detecting volatile chemical reagents based on fluorescence quenching analysis that is capable of detecting neutral electron acceptor molecules. The device includes a fluorescent material, a contact region, a light source, and an optical detector. The fluorescent material includes at least one polymer-surfactant complex. The polymer-surfactant complex is formed by combining a fluorescent ionic conjugated polymer with an oppositely charged surfactant. The polymer-surfactant complex may be formed in a polar solvent and included in the fluorescent material as a solution. Alternatively, the complex may be included in the fluorescent material as a thin film. The use of a polymer-surfactant complex in the fluorescent material allows the device to detect both neutral and ionic acceptor molecules. The use of a polymer-surfactant complex film allows the device and the fluorescent material to be reusable after exposing the fluorescent material to a vacuum for limited time.

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